Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.   (Currently Amended) A method of quantifying the amount of adsorbate adsorbed on a solid in a chamber comprising:

   a.   contacting the solid with an adsorbate for a period of time;

   b.   contacting the solid with an inert fluid while ramping the temperature of the ~~solid resulting~~ chamber in a specified temperature ramp rate with a fixed heat input profile ~~with respect to~~ determined by a blank run of the solid using no adsorbate;

   c.   measuring the change in temperature of the solid during the contacting with the inert fluid while ramping the temperature in the chamber according to the specified temperature ramp;

   d.   determining a mathematical function, f(t), describing the deviation of the measured changes in temperature over time from the specified temperature ramp rate;

   e.   determining a value of the desorption order, "m", that yields a linear relationship of $\ln[(-d\,N_A/dt)/N_A{}^m]$ vs $1/T$ where "N_A" is the total moles of adsorbate adsorbed on the solid, "t" is time, "t_p" is the time at which the extremum is observed, and "T" is temperature;

   f.   determining the activation energy for desorption using :

$$-v \cdot m \cdot N_A{}^{(m-1)} \cdot \exp\left(\frac{-E_d}{RT_p}\right) + \frac{E_d}{RT_p{}^2}[\beta - f'(t)] \bigg/_{t_p} = 0 \quad (7)$$

   when "m" is determined above to be 1, or using

$$-10^{13} \cdot \exp\left(\frac{-E_d}{RT_p}\right) + \frac{E_d}{RT_p{}^2}[\beta - f'(t)] \bigg/_{t_p} \quad (8)$$

   when "m" is determined above to be other than 1; and

   g.   determining the quantity of adsorbate adsorbed on the solid using:

$$N_A = \int\limits_{t_1}^{t_2} f(t) \cdot \frac{C_{ps}}{\Delta H} dt \qquad (1')$$

where "C_{ps}" is the specific heat of the solid and ΔH is the heat of adsorption of adsorbate "A" which is substantially equal to the activation energy for desorption determined above.

2. (Original) The method of Claim 19 wherein steps (a) through (g) are conducted on a plurality of solids.

3. (Original) The method of Claim 19 wherein the expression describing the deviation of the measured changes in temperature over time from the specified temperature ramp rate, f(t) is a polynomial described as:

$$f(t) = \sum_{i=0}^{n} a_i \cdot t^i$$

4. (Currently Amended) A method of determining at least one surface property of at least one solid or mixture of solids <u>in at least one chamber</u> comprising:

    a.   contacting the solid(s) or mixture(s) of solids <u>in the chamber(s)</u> with an adsorbate for a period of time;

    b.   contacting the solid(s) or mixture(s) of solids with an inert fluid while measuring the change in temperature of the respective solid(s) or mixture(s) of solids using a detector and while concurrently ramping the temperature <u>solid(s) or mixtures of solid(s)</u> at a controlled ramp rate using temperature controllers to a temperature sufficient to desorb adsorbed fluid;

    c.   controlling the heating of the ~~samples~~ <u>solid(s) or mixtures of solid(s)</u> and maintaining the controlled temperature ramp rate using the measured change in temperature of the solid(s) or mixture(s) of solids;

    d.   measuring the power requirements of the temperature controllers <u>during the ramping of the temperature of the solid(s) or mixture of solid(s)</u>; and

    e.   determining at least one surface property of the solid(s) or mixture(s) of solids from the measured power requirements as a function of time.